Operating Instructions

ERSA Wave Soldering System 500

Type: ***ERSA EWS 500 F***

Machine No.: **27308 046**

Customer:

ERSA Löttechnik GmbH

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A Kurtz Company

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3.6 Cooling module

Working width:	max. 500 mm
Compressed air connection:	min 4 bar
Compressed air cooling:	0...3 bar (infinitely variable)
Recommended setting::	approx. 1 bar

3.7 Exhaust system

Connection dimensions:	*see figure, chapter 3, page 1*
Extraction rate at exhaust port:	each exhaust port min. 400 m³/h, for ERSA-Spray fluxer ESF min. 800 m³/h

3.8 Solder pallet

Solder pallet internal dimensions
(without clip bridges)

Width:	540 mm
Standard length:	420 mm / 500 mm
Special length:	*on request*
Working width:	max 500 mm

3.9 Permanent noise level

It is confirmed that the permanent noise level does not exceed 85 dB (A).

3.4 Soldering module

3.4.1 LM 9 wave soldering machine

Output:	approx. 10.2 kW
Heating-up time:	approx. 3.5 h
Weight without solder:	approx. 90 kg
Solder volume:	approx. 550 kg (with alloy Sn/Pb 64/36)
Useful wave width:	450 / 500 mm
Wave height:	max. approx. 10 mm
Solder temperature:	230 - 300°C
Temperature accuracy:	+/- 1 % final value
Wave speed:	200 - 600 rpm

3.5 Conveyor system

3.5.1 Soldering pallet conveyor system

Conveyor speed:	0.3....3.0 m/min
Conveyor angle adjustment:	3 - 8 degrees (infinitely variable)
Working width:	450 / 500 mm

3.5.2 Finger Conveyor system (palletless)

Conveyor speed:	0.5...2.5 m/min
Conveyor angle adjustment:	7 degrees
Working width:	450 / 500 mm

3.3.3 Dynamic preheating cassette

Output:	max 13.2 kW (6 emitters, each 2.2 kW)
Useful preheating width:	approx. 500 mm
Dimensions:	Width 650 mm Length 400 mm

3.3.4 *Reserved*

3.2.4 Flux blowing-off facility

Working width:	450 / 500 mm
Blowing-off pressure:	0...3 bar (infinitely variable)
Pneumatic connection:	min 4 bar
Recommended blowing-off pressure:	0.3 - 0.4 bar

3.3 Preheating module

3.3.1 Medium-wave length emitter unit

Output:	max 4.0 kW (5 emitters, each 800 W)
Radiant temperature:	400...600°C
Useful preheating width:	approx. 500 mm
Dimensions:	Width 660 mm / Length 300 mm
Heating-up time (max.temp.):	approx. 5 min.

3.3.2 Short-wave length emitter unit

Output:	6.6 kW (3 emitters, each 2.2 kW)
Useful preheating width:	approx. 500 mm
Dimensions:	Width 650 mm Length 150 mm

3.2 Fluxer module

3.2.1 Foam fluxer

Flux volume:	approx. 4,5 litres (fluxer bath)
Working width:	450 / 500 mm
Foam height	approx. 10 mm
Flux storage tank:	max. 12 litres

3.2.2 ERSA spray fluxer ESF

(see operating instructions - chapter 12, appendix)

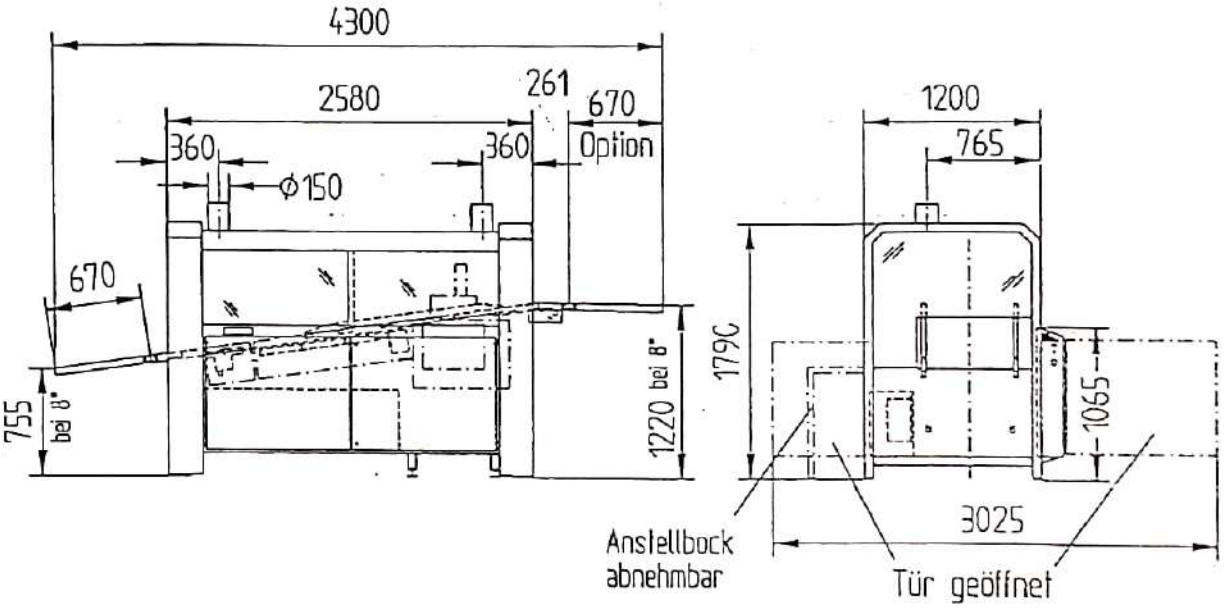
3.2.3 Automatic density regulation facility

Density measuring range: (TA = 20° C)	0.75 - 0.85 g/cm³
	0.80 - 0.90 g/cm³
	0.85 - 0.95 g/cm³
Resolution:	0.001 g/cm³
Measurement and control accuracy:	+/- 0.002 g/cm³
Storage tanks:	
Mixing tank	max. 12 litres *(large chamber on the right)*
Solvent tank	max. 6 litres *(small chamber on the left)*
Solvent pump Pumping time per digit deviation:	approx. 2 sec
Mixing time: *(Time between pumping cycles))*	approx. 3 min

3. Technical data.

3.1 System, complete

External dimensions: see figure



Empty weight:	approx. 1.000 kg
Power consumption:	max. 39,5 kW
Electrical data:	3 x 230/400 V, N, PE, corresp. DIN IEC 38 f_N = 50 Hz, J_N = 61 A
	max. fuse 3 x 63 A slow

4. Safety Instructions for Wave Soldering Systems

4.1 General

4.1.1
The ***ERSA Wave Soldering System*** is designed and built according to the latest technological standards and industrial safety regulations.
The machine and system can be a source of danger when used improperly by untrained personnel or when not used for the purpose for which it is designed.

4.1.2
Any person entrusted with the installation, start up, operation and/or maintenance and service of the soldering system must read and fully understand the complete operating instructions, more specifically Chapter 4, Safety Instructions.
It is recommended that the user confirm this in writing by the persons involved in the actual operation.

4.1.3
The *ERSA Wave Soldering System* is to be used for soft soldering only of electronic assemblies suitable for this process. Using the system for any other purpose will be considered non-compliant for its designated purpose.
The manufacturer/supplier shall not be held liable for any damage or injury as a result from this noncompliance.

4.1.4
The use of the machine and system for its designated purpose shall include complete observance of the operating and safety instructions.

4.1.5
Any modifications or deviations which may effect the safety of the *ERSA Wave Soldering System* are not allowed and exclude any liability on the part of the manufacturer/supplier for any damage or injury which may result.

4.1.6
Local safety and accident prevention regulations must be observed for the operation of the soldering system.

4.1.7
These operating instructions must always be kept available on the machine.

2. Introduction

2.1 General information on product

These operating instructions are generally valid for the ***EWS Series ERSA wave soldering machines***. Machines in this series are suitable for wave soldering flat component assemblies.

2.2 General information on operating instructions

These operating instructions are to fully inform the user of the machine entered on the cover sheet about the product he has purchased, its installation and operation, basic machine functions, irregularities and their elimination, servicing, maintenance and spare and wear parts.
Nevertheless, it is absolutely essential that one person be named for the here described machine who is responsible for the system at the user's factory and is qualified in soldering.

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will be only too pleased to answer any queries with regards to the handling of the machine or the use of this handbook.

Key to symbols and signs

This symbol stands for safety instructions which are to be observed. Non-observance can lead to personal injury.

Important: Important appears in front of sections of the text, the non-observance of which can lead to the machine and system being damaged.

➔ This symbol denotes the activity to be carried out.

☞ This symbol indicates additional information.

4.2 Instructions for Special Kinds of Hazards

4.2.1 Electrical Energy

4.2.1.1
Use only original fuses with the stipulated current rating. Turn machine and system off immediately when any irregularity occurs in the power supply.

4.2.1.2
Work on the electrical equipment must be performed by a qualified electrician or persons with electrical engineering training only, under the supervision of an authorized electrician in accordance with electrical engineering regulations.

4.2.1.3
Motors and parts of the machine which are to be inspected, serviced or repaired must be disconnected from the power supply if it is so stipulated. Check first the exposed parts to ensure that they are not under voltage before earthing and short circuiting, and isolate adjacent parts under voltage.

4.2.1.4
The electrical equipment of a machine or system must be checked regularly and any deficiencies such as loose connections or damaged cables are to be eliminated immediately.

4.2.1.5
Work to be carried out on parts under voltage must have a second person prepared to turn off the emergency switch or main switch with power cut-off respectively, in case of an emergency. The work area is to be cordoned off with a red and white safety chain and danger sign. Use fully insulated tools only.

4.2.2 Hydraulics, Pneumatics

4.2.2.1
Work on the hydraulic equipment is to be carried out only by persons with special knowledge and experience in pneumatics.

4.2.2.2
Check all lines, hoses and unions regularly for leaks and externally visible damage. Eliminate any damaged lines, hoses and unions immediately. Oil escaping from the machine can lead to injuries and fires.

4.2.2.3
Before starting repairs, sections of the system and pressure lines are to be opened (in the hydraulics and compressed air systems) and must be made pressureless in accordance with the instructions for the assembly concerned.

4.2.3 Flux, Solder, Oils, Grease and other Chemical Substances

4.2.3.1
Observe the safety regulations for the particular product when handling fluxes, solders, oils, grease and other chemical substances.

4.2.3.2
Extreme caution observed when hot operating materials and auxiliaries are being used to avoid the risk of burns or scalding.

4.2.3.3
During the soldering process, flux fumes arise. They are injurious to health.

4.2.3.4
Do not eat, drink or smoke in rooms in which soldering processes take place. Traces of lead on the hands could geht into the human body through food or cigarettes (health hazard).

4.2.3.5
Clean your hands thouroughly after having touched solder.

4.3 Safety Instructions for Specific Operations

4.3.1 Normal Operation

4.3.1.1
Do not do any work which will endanger safety.

4.3.1.2
Precautions must be taken to ensure the machine and system are operated safely. Run the machine and system only when fully functional with all guards and safety features are in place, for example, removable safety guards, emergency cut-out devices, soundproof enclosures, exhaust air extraction systems, etc.

4.3.1.3
Inspect the machine and system at least once per every shift for visible damage and/or irregularities. Report any observable changes/behaviors to immediate supervisor. If necessary stop or shut the machine down to safeguard injury or damage to the system.

4.3.1.4
Insure complete safety when the system is turned back on.

4.3.2 Special caution taken when using/repairing the machine and system - eliminate irregularities

4.3.2.1
Continue to adjust, service and inspect at specified intervals as outlined in the operating instructions, including replacement of parts and equipment by qualified personnel only.

4.3.2.2
Inform all operators when special work or repairs are going to be performed on the machine or system. Appoint one person in charge of this function.

4.3.2.3
When the machine is completely shut down for maintenance/repair be sure it is announced so that it will not be unintentionally turned on by:
- air lock the main control facilities and remove the key, and/or
- hang a „warning" sign on the main switch.

4.3.2.4
Before service or repair can begin, remove any oil, fuel or cleaning agents particularly from connections and unions. Do not use an aggressive cleaning agents, and use only non-fluffy cleaning cloths.

4.3.2.5
After completing maintenance and/or repair work, be sure to tighten up any loose screw connections.

4.3.2.6
If safety features need to be desmantled when setting-up, servicing and/or repairing the machine, the safety features must be immediately refitted and checked for complete assembly before re-starting.

4.3.2.7
Dispose of all materials used in the running of the machine and replaced parts being conscientious of the environment.
Solder waste is hazardous waste and must not get into the household waste.

4.4 Safety Instructions for Specific Machine Parts

A soldering machine is primarily a source of burns because molten metal and the appropriate heating systems are used.

4.4.1 Safety Instructions for Fluxer

In the case of any maintenance and cleaning work be sure the machine and system is not under voltage or pressure. The pressure can be relieved from the spray fluxer compressed air supply by means of the switch valve in the control desk of the fluxer module.

If the spray module is in the soldering system, be sure the heating system is cold (to eliminate danger of burns). When turning on the compressed air supply again, both the exhaust air duct and all windows and doors at the back of the module must be closed and air locked (to prevent injury).
After turning "ON" the control system, the fluxer is ready for service.

Fluxer must not be operated without the stipulated exhaust air extraction rate.
Risk of fire or explosion can occur by not complying with this precaution.

Important: The soldering machine and system are only safe in operation in conjunction with the stipulated exhaust air extraction rate which is to be insured by the user. The required exhaust air rate at each port is min. 400 m³/h (or 800 m³/h with the ERSA Spray Fluxer ESF).

Important: The machine and system are to be assessed at the place of installation as a fire risk.
Precautions are to be taken in accordance with the regulations and specifications and to be observed on site.

Danger of fire or explosion through non-observance

The concentration of highly flammable solvent vapors (flash point 285 k) must not exceed 25 % of the lower explosion limit (the lower explosion limit is 50 g solvent/vapor mixture for I-proponol).

4.4.2 Safety Instructions for Preheating System

Risk of burns

Medium-wave heater cassettes and short-wave heater units are to be cleaned only when cold - otherwise the cleaning agent with alcohol content could burst into flames.

The complete preheating zone including all fitting and dismantling parts are hot while the system is in operation (including heating up and cooling down phases).

Avoid contact with the preheating zone.

4.4.3 Safety Instructions for Soldering

Risk of burns

Protective clothing (goggles, gloves, apron, safety shoes, etc.) must be worn when working on the solder bath (for example, when changing the nozzle).

The complete soldering machine including all fitting and dismantling parts are hot while in operation (also during the heating up and cooling down phases).

The machine contains liquid metal. Liquid metal might splash out when solder is refilled or while working at the solder bath. Only specially instructed employees are allowed to execute this kind of work.
For this kind of work, rules for safety clothing have to be made available by the company.

When heating up the solder bath <u>and</u> during cool down, there is a slight possibility for solder erruptions to occur.
Therefore, during heating up and cooling down the system the safety doors have to be closed and may only be opened when the solder pumps are enabled by the safety provision (low temperature protection) or when the solder has completely cooled down.

Avoid contact with the soldering zone.